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Shreveport-Bossier City Metropolitan Statistical Area

Early Action Compact Air Quality Improvement Plan

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Executive Summary

This document presents the Air Quality Improvement Plan (AQIP) for the Shreveport-Bossier City Metropolitan Statistical Area (MSA) Early Action Compact (EAC). It represents the cornerstone of the EAC based on work conducted since the stakeholders from the MSA entered into the Memorandum of Agreement with the U.S. Environmental Protection Agency (EPA) in December 2002. One of the provisions of the EAC is that the AQIP be complete and submitted to the Louisiana Department of Environmental Quality (LDEQ) by March 31, 2004.

The objective of the Shreveport-Bossier City MSA EAC is to develop and implement an AQIP that will ensure that the current attainment status of the eight-hour ozone national ambient air quality standard (NAAQS) throughout Caddo, Bossier and Webster Parishes will continue in 2007 and 2012. As shown herein, modeling has demonstrated that attainment will continue through 2007 as well as 2012. Nonetheless, in order to support the objective that the MSA will continue to attain the eight-hour ozone NAAQS, the Greater Shreveport Clean Air Citizens Advisory Committee (CACAC) developed a list of control measures that the City of Shreveport and private industries will commit to implement by December 31, 2005. These local control measure commitments include:

- Installation of intelligent transportation systems to synchronize and improve traffic signal operations at 24 intersections as of the end of 2003.
- General Motors plant in Caddo Parish installed new volatile organic compound (VOC) abatement system as part of their new product line in October 2003.
- Center Point Energy has submitted a permit modification to reduce nitrogen oxides (NO_x) and VOC emissions by 90 percent at natural gas processing plant located in Bossier Parish. These proposed reductions of NO_x and VOC emissions should be in place by the end of 2005.
- Installation of a gas collection system on the City of Shreveport's municipal solid waste landfill. The landfill gas is piped to a local General Motors facility for use as boiler fuel. The pipeline began operations in November 2003.
- City of Shreveport will enter into a 20-year contract in 2004 with Johnson Controls, Inc. for the purpose of installing energy conservation equipment in 33 city buildings.
- City of Shreveport will purchase and place into operation a hybrid electric bus as one of its operating 46 public transit buses, resulting in reduced NO_x and VOC emissions in 2005.

The AQIP also contains a "contingency" provision, which would further require that the CACAC reconvene in the event that the eight-hour ozone design value would be exceeded (i.e., 85 ppbv or greater), at some point in the future during the term of the EAC. The contingency plan, if triggered, would require:

- CACAC will meet within 2 weeks of the exceedance to develop initial work plan;
- Control measures will be selected within 6 months and submitted to LDEQ;
- Within 12 months after that, any required rulemaking/ordinance adoption will be completed; and any required amendments to the State Implementation Plan will be completed, and
- Within 6 months after that, the selected control measures will be implemented.

The AQIP also documents the results of the eight-hour ozone attainment demonstration modeling analysis. The modeling analysis was prepared by ICF Consulting/Systems Applications International, Inc. (SAI) and is documented in a Technical Support Document (TSD), a copy of which is attached hereto as Appendix A. This AQIP summarizes the modeling methodologies and results detailed in the TSD.

As mentioned, the results of the eight-hour ozone attainment demonstration modeling analysis indicate the Shreveport-Bossier City MSA will be in attainment of the eight-hour NAAQS for ozone in 2007, and the recommended local control measures will result in additional modest reductions in ozone concentrations in the MSA. In addition, the maintenance modeling results indicate that, despite the expected growth in population between 2007 and 2012, the expected emission reductions resulting from the local EAC measures and national measures provide for further improvement in ozone air quality and maintenance of the eight-hour NAAQS in the Shreveport-Bossier City MSA.

Section 1

Introduction

This document presents the Air Quality Improvement Plan (AQIP) for the Shreveport-Bossier City Metropolitan Statistical Area (MSA) Early Action Compact (EAC). This plan is the official attainment/maintenance plan for the MSA developed under the EAC program. It is a comprehensive air quality plan that will be incorporated into a formal Louisiana State Implementation Plan (SIP) and the MSA will be required to carry out this plan as in nonattainment areas. Unlike a nonattainment area SIP, though, the AQIP is customized to local needs and driven by local decisions.

This document also presents a summary of the eight-hour ozone attainment demonstration modeling analysis presented in *ICF Consulting/Systems Applications International, Inc. (SAI), Early Action Compact Modeling Analysis for the Shreveport-Bossier City Metropolitan Statistical Area Technical Support Document, March 31, 2004* accompanying this AQIP (herein referred to as the Technical Support Document (TSD)).

The background and objectives of the AQIP are presented in Section 2 while Section 3 contains a summary of the background air quality in the MSA. Section 4 gives an overview of the photochemical modeling analysis and selection of the meteorological episodes used in the ozone modeling demonstration. Section 5 presents a summary of the Base-Case emissions inventory and modeling analysis. Section 6 presents the future-year modeling analysis. Section 7 presents the model attainment demonstration, while Section 8 presents a summary of the maintenance evaluation for 2012. Section 9 presents the AQIP contingency plan, and Section 10 presents the conclusions of the AQIP.

Section 2

Background and Objectives

This section provides the background and objectives of the EAC program, the Greater Shreveport Clean Air Citizens Advisory Committee (CACAC), and the work this committee has done since its inception.

2.1 Early Action Compact

The United States Environmental Protection Agency (EPA) endorsed the Texas Commission on Environmental Quality (TCEQ) Protocol for Early Action Compacts (EAC Protocols) on June 19, 2002. It established a process that offers areas that are in attainment of the one-hour ozone national ambient air quality standard (NAAQS), but approach or exceed the eight-hour ozone NAAQS, an opportunity to develop a voluntary air quality improvement plan through a compact between local, state and EPA officials. The EAC was developed by EPA on a national basis to establish control strategies, account for growth, and achieve and maintain the eight-hour ozone NAAQS.

The goals of the EAC program are to:

- Conduct early planning to develop enforceable control measures and emissions reductions necessary to achieve timely attainment and maintenance of the eight-hour ozone NAAQS;
- Develop local control measures with input from the public;
- Involve the State to guarantee technical integrity of the EAC plan;
- Integrate the early action plan into the State Implementation Plan (SIP);
- Defer the effective date of nonattainment designation and related requirements provided that all the EAC terms and milestones are met, and
- Establish ‘fail-safe’ measures to return areas to conventional SIP requirements in the event that EAC terms and/or milestones are not met, with proper recognition specified for each emission reduction measure executed.

The objective of the Shreveport-Bossier City MSA EAC is to develop and implement an AQIP that will ensure that the current attainment of the eight-hour ozone standard throughout Caddo, Bossier and Webster Parishes will continue in 2007 and 2012.

2.2 History of CACAC

In November 2000, an advisory committee, named the Greater Shreveport Clean Air Citizens Advisory Committee (CACAC or Committee), was established by the Mayor of Shreveport, consisting of representatives from various local stakeholder groups. The CACAC was tasked with assessing air quality issues in the Shreveport-Bossier

City MSA, developing a set of “recommendations for maintaining and improving local air quality, with an emphasis on ozone issues,” and reporting its findings to the local city and parish governing bodies. The members of the committee include representatives of the medical profession, academia, industry, utilities, the Greater Shreveport Chamber of Commerce, citizens groups, regional planning bodies, and local governments.

The Committee met regularly and worked diligently over the course of the next year and a half in order to complete its report within the time frame desired. Before completing its report in April 2002, the Committee was instrumental on a number of significant accomplishments, including:

- the creation of an ozone public awareness campaign, including the obtaining of a \$15,000 grant for public awareness projects pertaining to ozone issues;
- the obtaining of a \$400,000 federal appropriation for air quality technical support work for the local area, including emission inventory and modeling work; the opening of communication channels between the Shreveport-Bossier MSA, the EPA and the Louisiana Department of Environmental Quality (LDEQ) on air quality planning issues; and
- the obtaining of formal commitments from the governing bodies of Shreveport, Bossier City, Caddo Parish and Bossier Parish to work cooperatively and, specifically, to develop voluntary measures for the reduction of ozone precursor emissions and enter into an Ozone Flex Agreement with the EPA and LDEQ.

By April, 2002, the CACAC had completed its report, and in April and May of that year its findings and recommendations were presented to the Mayors and City Councils of Shreveport and Bossier City, as well as the Caddo Parish Commission and Bossier Parish Police Jury. The Committee’s recommendations included:

- Preparation and submission of an Ozone Flex Plan to EPA by year’s end;
- Development of a work plan for the federal appropriation received by the City of Shreveport for air quality planning work;
- Retention of an experienced technical consultant to assist with air quality planning;
- Establishment of working relationships with other area ozone planning groups, including the East Texas and Baton Rouge coalitions;
- Continuation and expansion of the ozone public awareness program;
- Participation in the U. S. Department of Energy’s “Clean Cities” program, for the promotion of alternative fuel vehicles; and

- Continuation of oversight by the CACAC on air quality matters concerning the Shreveport-Bossier City MSA.

As a result of the Committee's recommendations, a formal Intergovernmental Agreement was executed between Shreveport, Bossier City, Caddo Parish and Bossier Parish on June 6, 2002, providing for cooperative planning efforts on air quality matters among all the signatory governing bodies, and, among other things, including a pro rata sharing of the initial costs of a technical consultant to assist with development of the Ozone Flex Plan and a work plan for future technical work.

After considering the potential of an Early Action Compact for the Shreveport-Bossier City MSA, the CACAC, in September 2002, unanimously voted to recommend that the local governing bodies participate in the program. Accordingly, an EAC for the MSA was developed during the last quarter of 2002, was presented to and approved by the local governing bodies, and was signed by Shreveport, Bossier City, and Caddo, Bossier and Webster Parishes on December 12, 2002.

The CACAC continues to serve effectively as the link between the five local governing bodies, the EPA and LDEQ, and the general public on air quality planning matters, and served as the primary forum for public involvement and interaction in the planning process for control measure selection under the EAC.

2.3 Public Outreach Programs

Because of the historical attainment status of the one-hour ozone standard in the Shreveport-Bossier City MSA, there had not been a concentrated effort in place locally prior to 2001 to educate the public about ozone. Accordingly, the CACAC determined early on that a grass-roots ozone informational campaign was necessary for the area, to familiarize the community with ozone and the issues associated with it. Since 2001, much time and energy have been spent in this regard, which is summarized below.

- Held meetings with local media, and as a result of these efforts, the Shreveport Times and two television stations began including ozone forecasts in their daily weather reports.
- Established an air quality website on the City of Shreveport's home page (www.ci.shreveport.la.us/airquality) that includes daily ozone forecasts, and a telephone number for the local LDEQ office that provides real-time ozone levels.
- Held annual ozone season kickoff event at SciPort, a popular local children's science/discovery center.
- Printed and mailed ozone informational brochures with water bills to all Shreveport and Bossier City water customers (approximately 100,000 mailings).

- Established an ozone action program and network for the Shreveport-Bossier MSA that currently includes 22 major local employers (including city, parish and state governments; school boards; businesses; industries; hospitals; universities; utilities; etc.).
- Held the area's first "Clean Cities" program stakeholder meeting in June 2003, with over 40 representatives from local fleets and fuel providers in attendance.

This informational campaign has been effective in laying the groundwork for more meaningful stakeholder involvement and outreach activities specifically associated with the control measure selection process and other planning aspects of the EAC. As the modeling process has evolved, the CACAC continued to ensure that sufficient public outreach/awareness activities were planned in order to ensure that the public is fully involved in the local planning process contemplated by the EAC.

Section 3

Shreveport-Bossier City MSA Background Air Quality

The Shreveport-Bossier City MSA is currently in attainment for all pollutants with established NAAQS. In fact, as of 2002, the MSA has also achieved attainment with the new eight-hour average ozone NAAQS.

Eight-hour average ozone concentrations in the Shreveport-Bossier City MSA have improved over the past three years (2001-2003) as shown in **Table 3-1**. The MSA achieved attainment status for the eight-hour average ozone NAAQS in the summer of 2002. The preliminary monitoring data for 2003 shows a continued downward trend in the eight-hour average concentrations at both monitoring locations. The design values for eight-hour average ozone concentrations (defined as the three-year average of the annual 4th highest daily maximum eight-hour average ozone concentration) for the Dixie and Airport sites are 77 parts per billion by volume (ppbv) and 79 ppbv, respectively, for the period ending in 2003.

Table 3-1
Eight-Hour Average Ozone Maximum Concentrations for 2001-2003

Location	Year	8-Hour Daily Max. Concentrations (ppbv)				Avg. 4 th Highest Conc. ¹	No. Days ≥85 ppbv
		1 st	2 nd	3 rd	4 th		
Caddo (Dixie)	2001	85	83	78	77	84	1
	2002	80	79	77	75	79	0
	2003	86	82	80	80	77	1
Bossier (Airport)	2001	92	89	85	84	90	3
	2002	80	77	76	76	84	0
	2003	93	82	80	77	79	1

¹ Average 4th highest concentration is the average of the annual fourth highest eight-hour ozone averages over a three-year period. Year given is the ending year of the three-year period for this summary statistic.

Data Sources: Louisiana Department of Environmental Quality.
Early Action Compact for the Shreveport-Bossier City Metropolitan Statistical Area Comprising Bossier, Caddo, and Webster Parishes, December 12, 2002.
Shreveport-Bossier City MSA Clean Air Citizens Advisory Committee Meeting, October 1, 2003.

Section 4

Overview of Photochemical Modeling Analysis

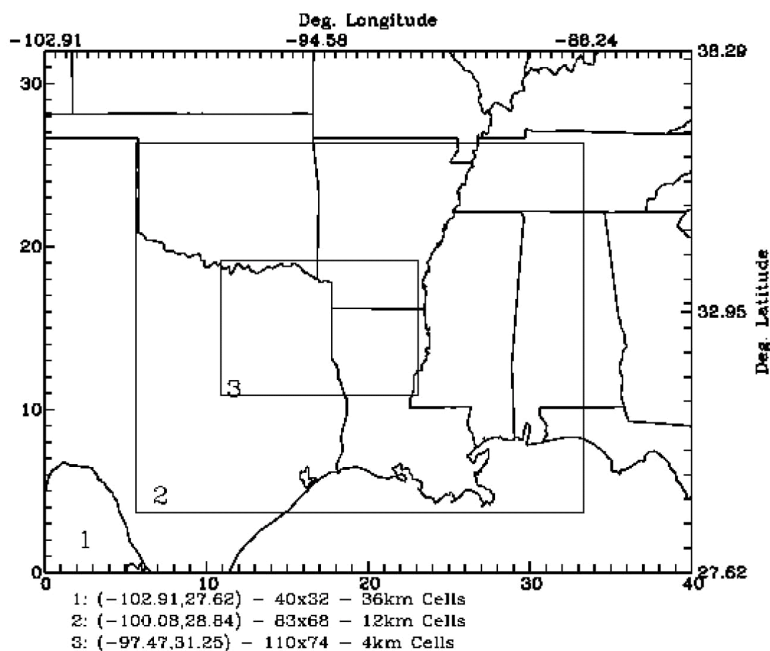
This section presents an overview of the photochemical model used for this study and the methodology and results of the meteorological episode selection.

4.1 Overview of Urban Airshed Model

The variable-grid Urban Airshed Model (UAM-V) Version 1.5, a regional- and urban-scale, nested-grid photochemical model, was used in the Shreveport EAC modeling analysis. The UAM-V model is a three dimensional photochemical grid model that calculates concentrations of pollutants by simulating physical and chemical processes in the atmosphere. The modeling domain used for the Shreveport EAC modeling was designed to model both regional and subregional influences. **Figure 4-1** shows that the domain includes a 36-kilometer (km) resolution outer grid encompassing the south-central U.S. (Grid 1 domain); a 12-km resolution intermediate grid (Grid 2 domain); and a 4-km resolution inner grid encompassing portions of northeastern Texas, northern Louisiana, and southern Arkansas, including the Shreveport-Bossier City MSA (Grid 3 domain).

Figure 4-1

UAM-V Modeling Domain for the Shreveport EAC Study



UAM-V was used to develop a conceptual model for eight-hour ozone conditions representing the Shreveport-Bossier City MSA. The conceptual model sets the stage for understanding the physical and chemical factors that influence ozone concentrations within the area of interest and that potentially result in exceedances of the eight-hour ozone NAAQS, and for subsequently determining the extent to which secondary (upwind or downwind) areas need to be encompassed within the modeling domain and included in the assessment of the results with respect to ozone and precursor transport. The conceptual model also provides the basis for identifying the type and frequency of occurrence of different types of eight-hour ozone episodes and thus for the selection of modeling episode periods or key days for analysis of the modeling results. Finally, the conceptual model serves to provide focus to the interpretation of the modeling results and the development of effective attainment and maintenance strategies.

As part of developing a conceptual model, an evaluation was conducted looking at:

- Regional-scale ozone concentrations and patterns;
- Meteorological characteristics of ozone episodes and
- Emissions influencing ozone.

4.2 Regional-Scale Ozone Concentrations and Patterns

Regional-scale ozone concentration patterns were evaluated for the Shreveport-Bossier City MSA and surrounding areas. Eight-hour ozone concentrations were examined throughout the region, and specifically for the Shreveport area of interest and other EAC and/or major metropolitan areas within the high-resolution modeling subdomain (Grid 3). The period 1996-2002 was specifically examined. This seven-year period was selected in order to optimize data availability for a consistent set of monitoring sites, capture the range of meteorological conditions associated with ozone exceedances in the areas, and limit the influence of emissions changes on the analysis and interpretation of results.

Some of the results from the examination of eight-hour ozone data for the 1996-2002 analysis period indicate that:

- Eight-hour ozone NAAQS exceedance days in Shreveport occurred at a rate of about five per year; these exceedance days were distributed over the seven years such that three of the DV periods were non-attainment, and two more were near non-attainment.
- Based on the 90th percentile values for eight-hour ozone, the highest ozone was observed in the Shreveport area during the summers of 1998-2000.

- Eight-hour ozone NAAQS exceedances occurred most frequently in conjunction with summertime meteorological conditions; during the period 1996-2002, the greatest number of exceedances (per month) occurred in July, but a similar number of days occur in August and early September.
- For the most part, the Shreveport (Downtown Airport) site drove the eight-hour ozone NAAQS exceedances in the Shreveport area. Of the 37 exceedance days between the two sites, 22 of these have higher ozone at the Shreveport site, whereas 15 have higher ozone in Caddo Parish.

A complete summary of the results is presented in Section 1 of the Technical Support Document.

4.3 Meteorological Characteristics of Ozone Episodes

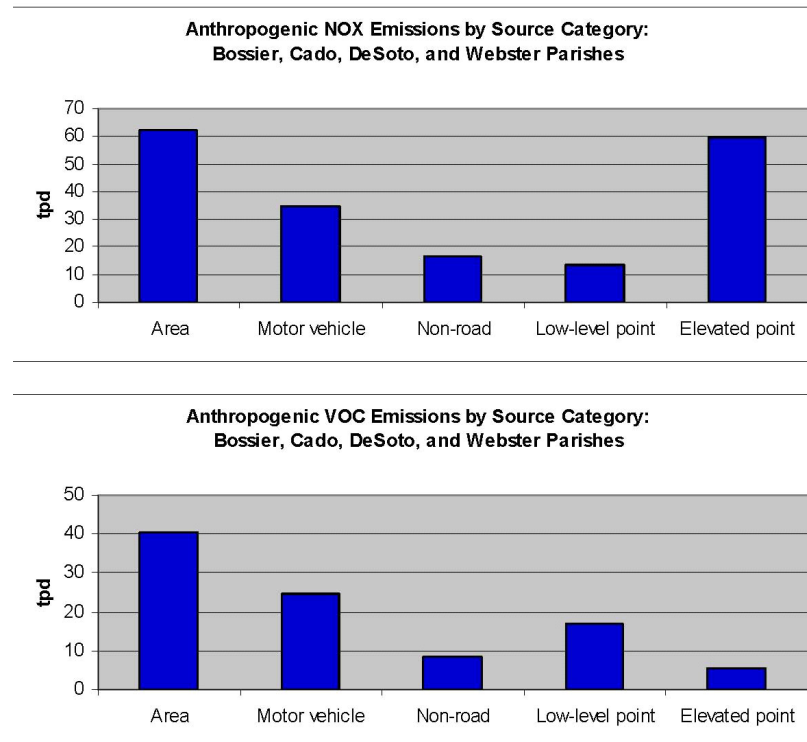
In general, ozone exceedances in Shreveport are associated with high pressure influencing the area. Based on a brief review of daily weather maps, the location of high pressure tends to be over the Shreveport area or to the east of Shreveport on the highest ozone days. Local meteorological conditions include high temperatures, stable morning lapse rates, low wind speeds, clear skies, and lower than usual relative humidity at the surface. Surface wind directions tend to veer to southwesterly or even westerly (from southeasterly) for higher ozone days, but the predominant southerly wind that characterizes most summer days both at the surface and aloft also occurs during high ozone days.

Ozone episodes within the Shreveport area occur under a variety of regional-scale meteorological conditions and prevailing wind directions. The regional-scale patterns, in turn, influence the development of local ozone-conducive meteorological conditions.

4.4 Emissions Influencing Ozone

Within the Shreveport area, there are numerous sources of nitrogen oxides (NO_x), volatile organic compounds (VOC), and carbon monoxide (CO) emissions that likely contribute to ozone production. Ozone precursor emissions from anthropogenic sources are the result of activity associated with transportation (both interstate and local), electrical generation, manufacturing/industry, and other population-related sources (household products, home heating, recreational equipment, etc.). There are several local industrial sources and one power plant located within the Shreveport area. In addition, a number of electrical generation stations and chemical and petrochemical industry sources are located in nearby northeast Texas. Plots of the anthropogenic NO_x and VOC emissions by source category are presented in **Figure 4-2**. In general, large sources of NO_x include electric generation, other industrial boilers, and mobile sources. The anthropogenic VOC emissions originate from a variety of area, industrial, and transportation-related sources.

Figure 4-2
Weekday Anthropogenic Emissions (tpd) in the Shreveport EAC Area
by Species and Source Category



Other sources influencing ozone concentrations in the Shreveport area are:

- Emission source areas to the west and south of the Shreveport area ensure the potential for a contribution from regional-scale transport.
- VOC emissions from biogenic sources, which are emitted from the region's extensive hardwood and softwood forests, other natural vegetation and from various crops that are raised in the region.

4.5 Episode Selection Procedures and Results

Episode selection for the Shreveport modeling/analysis was based on a review of historical meteorological and air quality data with emphasis on representation of typical ozone exceedance events in the area of interest. The episode selection analysis was focused on the Shreveport area, but considered information from ozone monitors in nearby states.

The primary objective of the episode selection analysis was to identify suitable periods for analysis and modeling related to the eight-hour ozone NAAQS for the Shreveport-Bossier City MSA. The methodology used for the episode selection analysis was based on the Classification and Regression Tree (CART) analysis technique. For this analysis, days within the period 1996 to 2002, were classified according to meteorological and air quality parameters using the CART analysis.

The CART results also provide the basis for the development of an integrated “conceptual model” of eight-hour ozone for the Shreveport area. To verify the consistency of the classification and the resulting identification of key meteorological conditions (the conceptual model) with that for a longer period, we also applied CART (per the request of EPA) for the ten-year period 1993-2002. The results for the ten-year period are consistent with those for the seven-year period and support the episode selection results.

The three episodes selected for this study each include two start-up days and one clean out day. The length of each episode was designed to capture the entire high ozone cycle for each area of interest as influenced by the synoptic and mesoscale meteorological conditions. The episodes also include both weekdays and weekend days. The three selected episodes include:

- 5-9 August 1999, Thursday-Monday.
- 13-17 July 2000, Thursday-Monday.
- 24-28 July 2000, Monday-Friday.

Section 5

Base-Case Modeling Analysis

This section describes the development and results of the Base- and Current-Year emissions inventory and Base-Case modeling simulations.

5.1 Base- and Current Year Emissions Inventory

The base- and current-year emission inventories were developed for the three Shreveport modeling episode periods (5-9 August, 1999; 13-17 July, 2000 and 24-28 July, 2000). The modeling inventories for the Shreveport 1999 base- and current-year (2000) episodes were prepared based on the following information:

- Final 1999 National Emission Inventory (NEI) Version 2.
- Emissions data provided by states or counties/parishes for specific years.
- Episode day-specific emissions data provided by individual facilities.

The 1999 NEI inventory includes annual and ozone season daily (available for some of the source categories and states) emissions for NO_x, VOC, CO, sulfur dioxide (SO₂), particulate matter with a diameter less than 10 and 2.5 microns (PM₁₀ and PM_{2.5}, respectively) and ammonia (NH₃).

In addition to the 1999 NEI, efforts were made to obtain the latest information available for each of the states and to incorporate these data into the modeling inventory.

5.1.1 Overview of Emissions Processing Procedures

To facilitate development of the detailed emission inventories required for photochemical modeling for this analysis, EPA's UAM Emission Preprocessor System, Version 2.5 (EPS 2.5) was used. This system consists of a series of computer programs designed to perform the intensive data manipulation necessary to adapt a county-level annual or seasonal emission inventory for modeling use. Point, area, non-road and on-road mobile source emissions data were processed separately through the EPS 2.5 system to facilitate both data tracking for quality control and the use of data in evaluating the effects of alternative proposed control strategies on predicted future air pollutant concentrations.

5.1.2 Area and Non-Road Emission Inventory Component

Area and non-road source emissions for all the states included in the Shreveport modeling domain were generated based on the 1999 NEI Ozone Season Daily estimates. County-level emissions estimates for the majority of non-road source emissions were developed using EPA's Draft NONROAD2002a model (EPA, 2003) with the monthly maximum, minimum and average temperatures (calculated from the 1970-2000 30-year historical averages) by state for the episode period. Aircraft,

commercial marine and locomotives were not included in the NONROAD model, and the emissions for these categories were taken from the 1999 NEI Version 2 data.

Modifications were made to the 1999 NEI data to correct the possible errors or make some improvements to the database.

5.1.3 Mobile-Source Emission Inventory Component

The county-level emission estimates for the on-road mobile source emissions were developed using MOBILE6.2. The MOBILE6.2 input files were used to generate the emission factors for total organic gasses (TOG), NO_x, and CO. The county-level emissions were calculated for each vehicle class and roadway classification by multiplying the appropriate emission factor from MOBILE6.2 by the county-level vehicle miles traveled (VMT) for that vehicle class and roadway classification using the program MVCALC.

5.1.4 Point-Source Emission Inventory Component

The point source emissions were generated based on the final version of the NEI99 database and data provided by Louisiana, Tennessee, Mississippi and Texas regulatory agencies, and point source data for specific facilities in the Shreveport-Bossier City MSA.

5.1.5 Offshore Emissions

The projected 2005 offshore area and point sources prepared for the Gulf Coast Ozone Study (GCOS) were incorporated in the inventory. The platforms were modeled as point sources, and other source categories were modeled as area sources.

5.1.6 Estimation of Biogenic Emissions

The EPA's Biogenic Emission Inventory System (BEIS-2) was used to estimate day-specific biogenic emissions for the modeling analysis with the Version 3.1 of the Biogenic Emissions Landcover Database (BELD3).

After each of the inventory components was completed and merged, the emissions were summarized by major inventory component for all grids in the modeling domain for each of the episode days. The final review was performed before the UAM-V modeling.

5.1.7 Summary of the Modeling Emission Inventories

The emission summaries are given by species (NO_x, VOC and CO) and by major source category. The low-level emissions include anthropogenic (area, non-road, on-road motor vehicle, and low-level point sources) and biogenic sources. Tables 3-1 through 3-12 and Figures 3-1 through 3-3 in Section 3 of the Technical Support Document present the results of the base-case emissions inventory. The tables provide emissions summaries for each meteorological episode day for each model grid domain, in tons per day. The figures provide graphical depictions of

anthropogenic and biogenic emissions for one representative day for the July 2000 episode for the Grid 3 domain. Overall, anthropogenic emissions do not vary as much day-to-day as biogenic emissions.

5.2 Meteorological Modeling Inputs

The UAM-V photochemical model requires hourly, gridded input fields of wind, temperature, water-vapor concentration, pressure, vertical exchange coefficients (K_v), cloud cover, and rainfall rate. These meteorological inputs were prepared for the Shreveport UAM-V application using the Fifth Generation Pennsylvania State University/National Center for Atmospheric Research (PSU/NCAR) Mesoscale Model (MM5).

MM5 is a state-of-the-science dynamic meteorological modeling system that has been used in several previous air quality modeling applications. The MM5 modeling system is widely used for meteorological research and air quality modeling studies and is currently supported by NCAR.

The MM5 application procedures and results from a detailed diagnostic analysis conducted for each meteorological episode are presented in Section 4 of the Technical Support Document.

5.3 Other Input Parameters

The UAM-V modeling system requires information on pollutant concentrations in the domain at the first hour of the first day of the simulation, and ozone concentrations in the lateral and top boundaries of the domain for each of the simulation days. It also requires land-use data, albedo, ozone column values, photolysis rates, and chemical reaction rates.

5.4 Base-Case Modeling Simulations

The first stage in the application of the UAM-V modeling system for ozone air quality assessment purposes consists of an initial simulation and a series of diagnostic and sensitivity simulations. These simulations are aimed at examining the effects of uncertainties in the inputs on the simulation results, identifying deficiencies in the inputs, and investigating the sensitivity of the modeling system to changes in the inputs. Model performance for each simulation is assessed through graphical and statistical comparison of the simulated pollutant concentrations with the observed data obtained from available monitoring stations located throughout the domain.

Once the results of the graphical, statistical, and sensitivity analysis show acceptable performance of the model for a given simulation, that simulation is called the “base-case” simulation. The base-case application of the UAM-V modeling system for the Shreveport modeling episode periods included an initial simulation, several diagnostic/sensitivity simulations, a final base-case simulation, and graphical and statistical analysis of each set of modeling results, including comparison with

observed air quality data for the 5-9 August 1999, 13-17 July 2000, and 24-28 July 2000 episode periods.

The model performance evaluation indicates that the combined base-case simulations provide a good basis for an eight-hour ozone attainment demonstration for the Shreveport area sites. Section 6 of the Technical Support Document presents detailed information on the Base-Case modeling simulations.

Section 6

Future-Year Modeling Applications

The Shreveport EAC future-year modeling analysis included the development of future-year emission inventories (2007 and 2012), and the application of the UAM-V modeling system for a “current” year of 2000 and two future years (2007 and 2012). In addition to the 2007 baseline scenario, emissions for 2012 were developed as required by EPA, to assess the effects of growth and as an evaluation of expected maintenance of the standard five years beyond the mandated attainment year of 2007.

The UAM-V modeling system was run for the three Shreveport episodes current-year (2000) emissions. This allowed the combination of results in applying the EPA modeled attainment test procedures, despite the different base years. Many of the comparisons presented in this section also rely on the 2000 current year results as the basis for comparison. Following the preparation of the 2007 baseline emission inventory, future-year baseline simulations for 2007 were run and the results were compared with the base- and current-year simulation results. Following completion of the 2007 baseline scenario, two types of future-year simulations were conducted:

- The UAM-V Ozone and Precursor Tagging Methodology (OPTM) was applied to the 2007 baseline simulation to assess the contribution to ozone concentrations from NO_x and VOC emissions from various source categories or source areas within the Shreveport regional modeling domain.
- A control-strategy scenario for 2007 was modeled to examine and quantify the effects of specific emissions changes (for selected sources and source categories) for selected EAC measures.

Following a discussion of the future-year emission inventory preparation, the future-year modeling results are presented and discussed in this section.

6.1 Future-Year Emission Inventory Preparation

The projection of the Shreveport EAC base year emission inventory to the future years required the use of economic growth factors. These are applied to the various industrial sectors and source categories to reflect expected future growth (or decline) in industrial activity and resulting emissions. For the Shreveport EAC modeling analysis, the future-year emission inventories for 2007 and 2012 were developed using economic growth factors provided by the BEA. Specifically, the state-specific gross state product (GSP) factors were used for all states (except Louisiana, where employment factors were used) within the modeling domain.

In addition to the economic growth factors provided by the BEA, state and federal agency information and databases were used to determine future changes in emissions.

6.2 Summary of the Modeling Emissions Inventory

Figures 7-1 through 7-4 in the Technical Support Document provide emission summaries for each major source category for NO_x, VOC and CO, in tons per day. The low-level emissions include anthropogenic (area, non-road, on-road motor vehicle, and low-level point sources) and biogenic sources. These figures present a comparison of total emissions for each of the Shreveport Grid 3 domain and the Shreveport 4-parish area for 2000 and 2007. For Grid 3, the expected changes in emissions in 2007 from 2000 result in a 29 percent reduction in anthropogenic NO_x emissions, and a 16 percent reduction in anthropogenic VOC emissions. The component emission totals for NO_x and VOC for the Shreveport 4-parish area (Caddo, Bossier, Webster, and DeSoto) for a typical weekday (24 July 2000) were also compared with the 2007 baseline emissions. For the 4-parish area, the expected changes in Shreveport area emissions in 2007 from 2000 result in a 13 percent reduction in anthropogenic NO_x emissions and a 33 percent reduction in anthropogenic VOC emissions.

The summaries of the 2007 baseline emissions for each modeling episode are provided in Section 7 of the Technical Support Document.

6.3 Baseline Simulations Results for 2007

As described above, the Shreveport EAC future-year baseline simulation incorporates the effects of population and industry growth (or, in some cases, decline) as well as national or statewide control measures or programs that are expected to be in place by 2007. Only the emissions inputs were directly modified for the future-year baseline simulation. The baseline simulation results provide the starting point for assessment of the effects of further emission reductions on future ozone air quality. The future-year baseline simulation results for Grid 3 and Shreveport 4-Parish area indicate that with the expected reductions in emissions in 2007, there is a 30 to 65 percent reduction in the value of these metrics compared to the 2000 simulation.

Another metric that is important in assessing and demonstrating simulated attainment in the future year is the estimated design value (EDV). **Table 6-1** presents the maximum EDV's for the Shreveport area monitors. These are presented for the 1999-2001 and 2000-2002 periods. The EDV's are calculated for concentrations within 15-km of the monitoring site and within the 9 grid-cell area surrounding the site. Using the 1999-2001 observed DV, the EDV for the Caddo Parish monitor is 74 ppbv using concentrations within 15-km and 73 ppbv using the 9 grid-cell concentrations, both well below the attainment target. For the Shreveport monitor, the EDV is 84 ppbv using both the 15-km and 9 grid-cell concentrations. According to EPA guidance, the 1999-2001 DVs should be used in calculating the EDVs for the Shreveport monitors, since 2000 is the current year. However, when the 2000-2002 DVs are used, the Caddo Parish EDV drops to 70 ppbv for both the 15-km and 9 grid-cell concentrations. The EDVs for Shreveport monitor drop to 78 and 79 ppbv, respectively, using the 15-km and 9 grid-cell concentrations. In summary, the

expected regional and local emission reductions between 2000 and 2007 result in EDVs for the Shreveport area indicating attainment of the eight-hour ozone NAAQS.

Table 6-1

Maximum Observed and Estimated Design Values (EDVs) for the Shreveport EAC Area Monitors for the 2007 Baseline Simulation

Site	1999–2001			2000–2002		
	Observed DV	EDV (15-km)	EDV (9-cell)	Observed DV	EDV (15-km)	EDV (9-cell)
Caddo Parish	83	74	73	79	70	70
Shreveport	90	84	84	84	78	79

6.4 Emissions Tagging Simulations

For the Shreveport EAC modeling analysis, the Ozone and Precursor Tagging Methodology (OPTM) approach was used to examine the contributions from selected emission source regions and source categories to simulated ozone for the 2007 baseline simulation within and surrounding the Shreveport area. Emissions from specific areas within the modeling domain and corresponding to specific source categories were tracked using separate tags. OPTM provides estimates of the contribution of emissions from specified source categories or source regions to the simulated ozone concentrations. The estimates are made for the existing conditions within the simulation.

6.4.1 Shreveport OPTM Results

The Shreveport EAC modeling analysis included two sets of tagging simulations, which tracked contributions to ozone from different emissions sources and source regions. The 2007 baseline simulation for each of the episodes was redone for each of the tagging scenarios called ST-1 and ST-2. The specific tags for each scenario are as follows:

Scenario ST-1:

- Shreveport 4-parish area.
- All other areas of Louisiana.
- Tyler/Longview/Marshall 5-county EAC area (NETAC area).
- All other areas of Texas.
- All other emissions, including biogenic emissions.

Scenario ST-2:

- Area and non-road emissions from Shreveport 4-parish area.
- On-road mobile source emissions from Shreveport 4-parish area.
- Low-level point sources from Shreveport 4-parish area.
- Elevated point sources from Shreveport 4-parish area.
- Biogenic emissions.
- All other emissions.

In each case, NO_x and VOC emissions are tagged explicitly and each scenario also included an additional tag for all emissions not otherwise tagged in that scenario. In total, the first Shreveport tagging scenario provided a comparison of contribution from anthropogenic emissions in the local Shreveport 4-parish area, the rest of Louisiana, the adjacent Northeast Texas area, the rest of Texas, and all other sources beyond these areas, which included biogenic emissions. The second scenario focused on particular source categories within the Shreveport 4-parish area, but also tracked contribution from biogenic emissions separately. These simulations provided information regarding the relative contribution of the emissions to observed and simulated ozone in the Shreveport area from local sources and regional sources located in Louisiana and Texas which was used to guide the selection of control measures (e.g., NO_x vs. VOC controls) based on their expected relative effectiveness in reducing ozone in the Shreveport area.

The results for the ST-1 simulation are:

- NO_x from local sources is the largest contributor overall of the specific geographic tags.
- Relative contributions from the other tagged regions vary by episode and the two sites, with significant influence from other Louisiana and Texas sources indicated on certain days.
- Biogenic VOC is the dominant contributor to simulated ozone in the 4-parish area.
- About 5-15 percent of simulated ozone is attributable to local and other Louisiana and Texas anthropogenic VOC emissions.

The results for the ST-2 simulation are:

- NO_x emissions from area and non-road sources and elevated point sources are the largest local source-category contributors to the simulated ozone in the four-parish area.
- Contribution from on-road mobile NO_x is proportionately less than for larger urban areas, but does show up as important for certain days at the monitoring sites.
- Biogenic VOC accounts for about 40–60% of the VOC contribution.

6.5 Control Measures Simulations Results for 2007

Because the expected local and regional emission reductions in 2007 resulted in simulated attainment of the eight-hour ozone NAAQS, with estimated design values of 84 ppbv or less for the Shreveport area monitors, no emission reduction sensitivity simulations were conducted as part of this analysis. Instead, the City of Shreveport and the CACAC identified local emission reduction measures for inclusion in the Shreveport AQIP and for evaluation in the modeling analysis. These control measures are discussed in more detail below.

6.5.1 Local Control Measure Commitments

The objective of the EAC is to develop and implement local/regional emissions reduction strategies to ensure the Shreveport-Bossier City MSA will continue to meet the eight-hour average ozone NAAQS in the future. The Shreveport-Bossier City MSA is unique among most EAC participants in that it has been designated by EPA as in attainment for the eight-hour average ozone NAAQS¹. Therefore, unlike nonattainment areas, there are no defined levels of reductions necessary to achieve attainment. In addition, the photochemical modeling analysis results indicate the EAC MSA will be in attainment of the eight-hour ozone NAAQS in 2007. The 2007 base-case modeling results indicate that eight-hour ozone design values will be 74 ppbv and 84 ppbv at the Caddo and Shreveport monitoring stations, respectively. Both these design values are below the 85 ppbv eight-hour ozone NAAQS. Furthermore, the latest three years of eight-hour ozone monitoring data shows that the Shreveport-Bossier City MSA is currently well below the eight-hour ozone NAAQS (See Section 3).²

¹ Green, R.E., U.S. EPA, Regional Administrator (6RA), Letter to M. Foster, Jr., Governor of Louisiana, Louisiana Eight-hour Ozone NAAQS Attainment Status, December 3, 2003.

² The modeling analysis for 2007 is based upon the 2001 design values for the local monitoring sites, because the 2001 values cover the time period of the particular episodes which were selected for the modeling process. As mentioned, the design values for these sites have since decreased significantly, as shown in Table 6-1. However, even though the future case modeling analysis is based on the higher 2001 values rather than the more current (and significantly lower) values, the analysis still shows the area to be in attainment in 2007 (79 and 84 ppbv at the Caddo and Shreveport sites, respectively).

In light of the area's current (as well as modeled future) attainment status, the CACAC had discussions with both EPA and LDEQ regarding the appropriate approach to take in developing our AQIP. It was agreed that the AQIP would include a list of control measures that the City of Shreveport and private industries will commit to implement by December 31, 2005, as discussed more fully below.

The AQIP also contains a "contingency" provision, which would further require that the CACAC reconvene in the event that eight-hour ozone design value is exceeded (i.e., 85 ppbv or greater), at some point in the future during the term of the EAC (See Section 9).

In addition to the control measures agreed upon in the Ozone Flex Agreement and those federally mandated (e.g., low-sulfur gasoline), the other local control measures contained in the AQIP for implementation by the end of 2005 include:

- Installation of intelligent transportation systems (ITS) to synchronize and improve traffic signal operations at 24 intersections as of the end of 2003.
- General Motors plant in Caddo Parish installed new VOC abatement system as part of their new product line in October 2003.
- Center Point Energy has submitted a permit modification to reduce NO_x and VOC emissions by 90 percent at a natural gas processing plant located in Bossier Parish. These proposed reductions of NO_x and VOC emissions should be in place by the end of 2005.
- Installation of a gas collection system on the City of Shreveport's municipal solid waste landfill. The landfill gas is piped to a local General Motors facility for use as boiler fuel. The pipeline began operations in November 2003.
- City of Shreveport will enter into a 20-year contract in 2004 with Johnson Controls, Inc. for the purpose of installing energy conservation equipment in 33 city buildings.
- City of Shreveport will purchase and place into operation a hybrid electric bus as one of its operating 46 public transit buses, resulting in reduced NO_x and VOC emissions in 2005.

ITS components were installed by the City of Shreveport at 24 intersections located in an area bounded by LA1 (Youree Drive), LA511 (E70th Street) and LA526 (Bert Kouns Industrial Loop). These components include new timing plans, optimal cycle lengths, vehicle detection, fiber optic communications, and modern, solid state controller equipment. NO_x and VOC emissions reductions were estimated by LDEQ based on the Highway Capacity Manual (HCM) Intersection Analysis using the SIG/Cinema v.2.12 model and EPA's MOBILE6 model. Traffic data and signal timing information

for each intersection was provided by the City of Shreveport Traffic Engineering Division.

Four signals representing the variety of conditions for the 24 intersections were selected to represent the average changes to the entire system. Each of these signals was given a before and after HCM analysis and the results were averaged to give a system wide emissions reduction. The HCM analysis output provided an average delay in seconds per vehicle for each intersection analyzed. Multiplying the intersection average delay by the average hourly traffic volume provided the total delay in vehicle-hours per hour. After calculating the average total delay, MOBILE6 was used to obtain VOC and NO_x emissions factors for the different vehicle classifications. The MOBILE6 model was run using the 2.5 mph speed, which gives idling emissions factors. The VOC and NO_x emissions factors were generated in grams per mile (g/mi). These units were multiplied by 2.5 to convert to grams per hour. These values were then converted to kilograms per hour and multiplied by the total delay in vehicle-hours to obtain the total emissions for both before and after the installation of ITS. These emissions estimates were subtracted and converted to tons per day to estimate the overall NO_x and VOC emissions reductions.

Estimated annual emissions reductions at the General Motors plant and at Center Point Energy were provided by personnel at each facility. These annual emissions reductions were converted to daily values assuming 365 day operations for the purposes of the photochemical modeling analysis.

The vendor of the hybrid bus (Gillig) provided NO_x and VOC emissions factor reductions in g/mile. The NO_x emissions would be reduced by 55 percent (16.7 g/mi) and the VOC emissions would be reduced by 100 percent (0.14 g/mi) compared to a heavy-duty diesel bus. In order to estimate daily emissions reductions, MOBILE6 was used to obtain vehicle miles traveled (VMT) for heavy-duty diesel buses. The national average VMT for heavy-duty diesel buses is 95.4 VMT per day. Using the gram per mile emissions factors presented above and the VMT/day, emissions reductions were calculated in tons per day. It should be noted that the estimated VOC daily emissions reduction was less than one thousandth of a ton per day, and therefore was not used in the photochemical modeling analysis.

NO_x and VOC emissions reductions have not been quantified for the installation of the gas collection system on the City's municipal solid waste landfill nor for the energy conservation program, and therefore are not included in the 2007 control measures modeling results. This is the result of insufficient information necessary to quantify emissions reductions for both control measures at this time. However, the City is currently partnering with the EPA, DEQ, Louisiana Department of Natural Resources, Louisiana State University, AEP-SWEPCO (the local electrical utility), and other agencies on an innovative program to calculate emission reduction credits resulting from its energy efficiency initiative. This control strategy will follow EPA's draft guidance in developing the reductions, and the energy savings will be tracked

for verification via a performance contract. Emission reduction estimates will be generated with EPA's assistance and will be determined prior to the state's SIP submission in December, 2004.

Table 6-2 presents a summary of these local control measure commitments, estimates of their potential emissions reductions. Those control measures with estimated emissions reductions were included in the 2007 control measures and 2012 maintenance modeling analyses.

Table 6-2
Local Control Measure Commitments

Control Measures		Emission Type	Emissions Reductions (tons/day)		Location
ID.	Description		NO _x	VOC	
1	Center Point Energy Plant Modification ¹	Elevated Point Source	2.56	0.135	Bossier Parish
2	General Motors Plant Modification ²	Low Level Point Source		1.37	Caddo Parish
3	Landfill Gas Recovery Project ³	Area	--	--	Caddo Parish
4	Energy Conservation Program ⁴	Area	--	--	Shreveport, Caddo Parish
5	Intelligent Transportation Systems ⁵	Mobile	0.0095	0.048	Shreveport, Caddo Parish
6	Replace a diesel bus with hybrid electric bus ⁶	Mobile	0.002	--	Shreveport, Caddo Parish

Notes: ¹ Centerpoint Energy has proposed to reduce emissions at its natural gas processing plant, including an approximate 90% reduction in NO_x emissions.

² General Motors plant installed a new VOC abatement system as part of their new product line in October 2003. Estimated VOC emission reduction of 500 tons per year.

³ City of Shreveport installed a landfill gas collection system at the City's landfill. The landfill gas is piped to a local General Motors facility for use as boiler fuel. The pipeline began operations in November 2003. Emissions reductions have not been calculated for this control measure by the Louisiana Department of Natural Resources (LDNR).

⁴ City of Shreveport will enter into a 20-year contract in 2004 with Johnson Controls, Inc. to install energy conservation equipment in 33 city buildings. Emissions reductions have not been calculated for this control measure by the LDNR. EPA and LDNR are collaborating to develop methods for quantifying emissions reduction benefits for energy conservation programs, which may be used in a future update of the photochemical modeling analysis.

⁵ Intelligent Transportation Systems installed by the City of Shreveport to synchronize and improve traffic signal operations at 24 intersections located in an area bounded by LA1 (Youree Drive), LA511 (E70th Street), and LA 526 (Bert Kouns Industrial Loop).

⁶ City of Shreveport will purchase and place into operation one hybrid electric bus as one of its 46 operating buses in 2005. NO_x emissions reductions are based on a 55 percent reduction in NO_x (16.7 g/mi NO_x reduction) and 95.4 vehicle miles traveled per day (MOBILE6 National Average).

Section 7

Model Attainment Demonstration

This section presents results from the application of the draft EPA eight-hour ozone attainment demonstration procedures. These procedures are outlined in the draft guidance document on using models and other analyses to demonstrate future attainment of the eight-hour ozone NAAQS (EPA, 1999). They were adapted for the Shreveport modeling domain and simulation periods and applied using the results from the final control-measures scenario as presented in Section 6.5. The draft EPA guidance on eight-hour ozone modeling recommends that an attainment demonstration include three elements: (1) a modeled attainment test, (2) a screening test, and (3) a weight-of-evidence determination. A detailed discussion of this attainment demonstration is presented in Section 8 of the Technical Support Document.

7.1 Summary of Attainment Demonstration

The attainment and screening tests and additional corroborative analyses indicate that the Shreveport EAC area will continue to be in attainment of the eight-hour ozone NAAQS by 2007, without the need for any additional local controls. In addition, the values of the simulated ozone exposure metrics indicate a significant but not large reduction in eight-hour ozone for the 2007 control measures simulation - the number of grid cells with hourly or eight-hour ozone concentrations greater than 84 ppbv is reduced by about 30 percent and the amount of ozone greater than this value is reduced by about 50 percent. While a good portion of this reduction is achieved for the 2007 baseline, some additional reduction is simulated for the control measures. These measures are expected to result in meaningful further ozone reductions by 2007, compared to the baseline values. This attests to the effectiveness of the control measures in supporting the attainment demonstration for 2007 and adds to the strength of the modeled attainment demonstration in that attainment is being achieved through a combination of national, regional, and local control measures.

Both of the monitoring sites in the Shreveport EAC area have future-year estimated design values for eight-hour ozone that are less than or equal to 84 ppbv. The 2007 EDV for the key Shreveport monitoring site is 84 ppbv if the 1999-2001 design value is used and less than 80 ppbv if the 2000-2002 or 2001-2003 design values are used. Similarly the value is 77 ppbv if a meteorologically adjusted design value for 1999-2001 is used.

Based on the values for the other years as well as the indications from the meteorological adjustment, use of the 2000-2002 design value likely represents a true worst case for Shreveport for 2007. The 1999-2001 design value, as used for the modeled attainment test, is one of the highest recorded in recent years. The design value analysis suggests that this is in part due to more days with ozone conducive meteorological conditions in both 1999 and 2000 than occur during a typical year. It is also worth noting that major road construction was underway in the Shreveport area during all of 2000 (24 hours a day, from I-49 to Westerfield in Bossier City), and that

this resulted heavier than normal traffic congestion along the interstate. Thus, higher than normal emissions may have also contributed to the high ozone observed during this time period.

Therefore, the modeled attainment test is passed, the screening test is not required, and all weight of evidence indicates that the Shreveport EAC area will continue to be in attainment of the eight-hour ozone NAAQS in 2007.

Section 8

2012 Maintenance Modeling Analysis

One of the requirements of the Early Action Compact is to evaluate maintenance of the eight-hour ozone NAAQS for 2012, five years beyond the mandated attainment date of 2007. As such, a 2012 baseline emission inventory was developed for the Shreveport modeling episodes and 2012 baseline simulations were conducted. The development of the 2012 baseline emission inventory followed the same procedures as those used in developing the 2007 emission inventory (See Section 6.1). Specific details are presented by source category are presented in Section 9 of the Technical Support Document.

8.1 Summary of 2012 Modeling Emissions Inventory

Figures 9-1 through 9-4 in the Technical Support Document provide emission summaries for each major source category for NO_x, VOC and CO, in tons per day. The low-level emissions include anthropogenic (area, non-road, on-road motor vehicle, and low-level point sources) and biogenic sources. These figures present a comparison of total emissions for each of the Shreveport Grid 3 domain and the Shreveport 4-parish area for 2000, 2007, and 2012. For Grid 3, the expected changes in emissions between 2000 and 2012 result in a 24 percent reduction in anthropogenic NO_x emissions, a 21 percent reduction in anthropogenic VOC emissions, and a 25 percent reduction in CO emissions. The figures indicate that precursor NO_x, VOC, and CO emissions in the Shreveport regional domain and the 4-parish area are expected to decrease further in 2012 compared to 2007 as a result of vehicle fleet turnover and a number of new national rules affecting on-road and off-road engine and fuel requirements.

8.2 Maintenance Modeling Results for 2012

The 2012 baseline simulation was conducted for all three of the Shreveport EAC modeling episodes. Section 9 of the Technical Support Document (Table 9-1) presents a comparison of one-hour and eight-hour metrics for the 2000 current year simulation and the 2012 baseline simulation. Compared to the metrics for the 2007 baseline simulation, the results for 2012 show substantial additional reductions in all of the metrics with reductions from the 2000 current year between 40 and 70 percent. **Table 8-1** presents the maximum EDVs for 2012 for the Shreveport area monitors using both the 1999-2001 and 2000-2002 base year design values. The EDVs for 2012 are lower for these monitors by 2 to 3 ppbv compared to the 2007 baseline. The modeling results indicate that, despite the expected growth in population between 2007 and 2012, the expected emission reductions reflecting the local EAC measures and national measures provides for further improvement in ozone air quality and maintenance of the eight-hour ozone NAAQS in the Shreveport EAC area.

The summaries of the 2012 baseline emissions for each modeling episode are provided in Section 9 of the Technical Support Document.

Table 8-1
Maximum Observed and Estimated Design Values (EDVs)
for the Shreveport EAC Area for the 2012 Baseline Simulation

Site	1999–2001			Observed DV	2000–2002	
	Observed DV	EDV (15-km)	EDV (9-cell)		EDV (15-km)	EDV (9-cell)
Caddo Parish	83	72	72	79	68	68
Shreveport	90	81	83	84	76	77

Section 9

Contingency Plan

The CACAC recognized that while the local MSA is currently in attainment and is forecast to remain in attainment for the foreseeable future, circumstances could arise that could cause ozone levels to rise above the predicted levels.

Consequently, this AQIP also contains a “contingency” provision, which would require that the Committee reconvene in the event that the local design value reaches or exceeds an eight-hour ozone level of 85 ppbv at some point in the future during the term of the EAC. Results from control measures simulations indicate that a 10 percent reduction in NO_x alone (or NO_x and VOC combined) would reduce the MSA’s eight-hour ozone design value by 2 ppbv. The 2007 modeling results also indicate that NO_x emissions from area and non-road sources and elevated point sources are the largest local source-category contributors to the future ozone concentrations in the 4-parish area. The CACAC would use this information as a starting point for developing and implementing new emissions control measures, should such be needed.

However, rather than commit to particular contingency control strategies at the outset of the AQIP, the CACAC believes it would be more prudent to keep all local control measure options open at this point so that the particular circumstances which trigger a contingency (as well as ongoing/updated emissions inventories and modeling analyses) are properly taken into account in the control measure selection process, should such action become necessary.

In the event that eight-hour ozone concentrations meet or exceed the 85 ppbv level, the following proposed contingency plan would be implemented:

- CACAC will meet within 2 weeks of the exceedance to develop initial work plan;
- Control measures will be selected within 6 months and submitted to DEQ;
- Within 12 months after that, any required rulemaking/ordinance adoption will be completed; and any required amendments to the State Implementation Plan will be completed, and
- Within 6 months after that, the selected control measures will be implemented.

Section 10

Conclusions

The results of the eight-hour ozone attainment demonstration modeling analysis indicate the Shreveport-Bossier City MSA will be in attainment of the eight-hour NAAQS for ozone in 2007, without the need for local control measures, and that the recommended local control measures will create additional modest reductions in ozone concentrations in the MSA. In addition, the maintenance modeling results indicate that, despite the expected growth in population between 2007 and 2012, the expected emission reductions reflecting the local EAC measures and national measures provides for further improvement in ozone air quality and maintenance of the eight-hour ozone NAAQS in the Shreveport-Bossier City MSA.

In the event that the Shreveport-Bossier City MSA should reach or exceed an eight-hour ozone level of 85 ppbv, the CACAC would implement its contingency plan, ensuring that early and effective actions would be taken to return the MSA to attainment status.